

ANNEX 1

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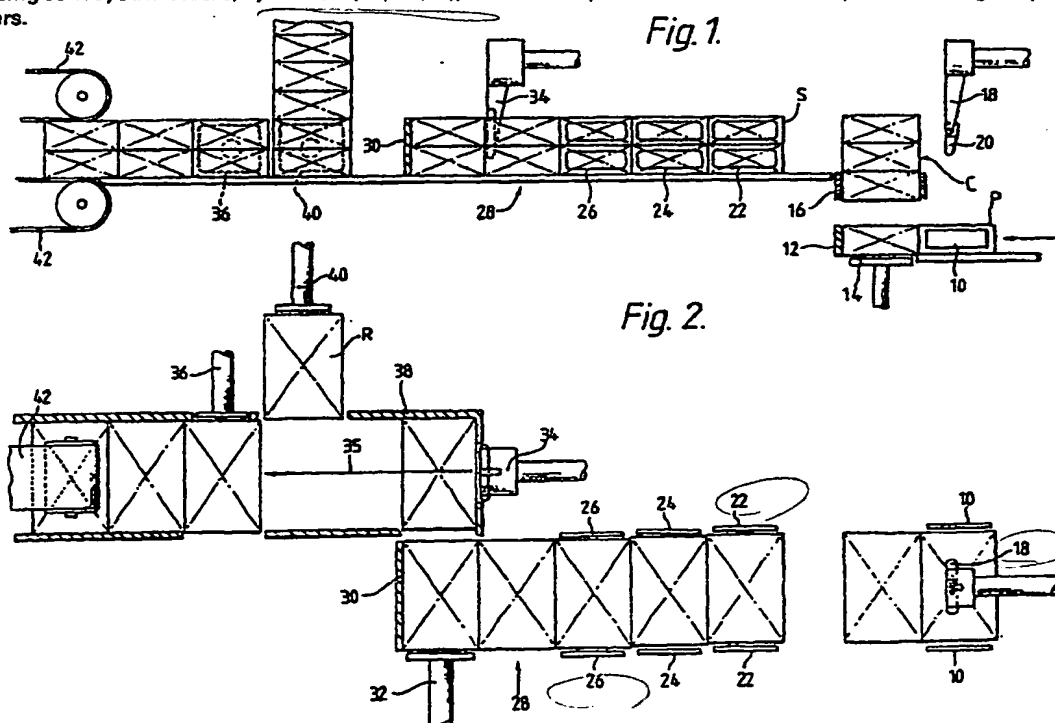
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(54) Sealing wrapped packets

(57) In an arrangement for conveying stacks of wrapped packets to a parceller, the end closures of the wrapped packets are partially sealed by tack heaters (10), and the sealing is completed on a horizontal conveyor (18), when the packets are being conveyed in stacks, by heaters (22) to (26), so that each packet in a stack is acted upon three stages by these heaters.

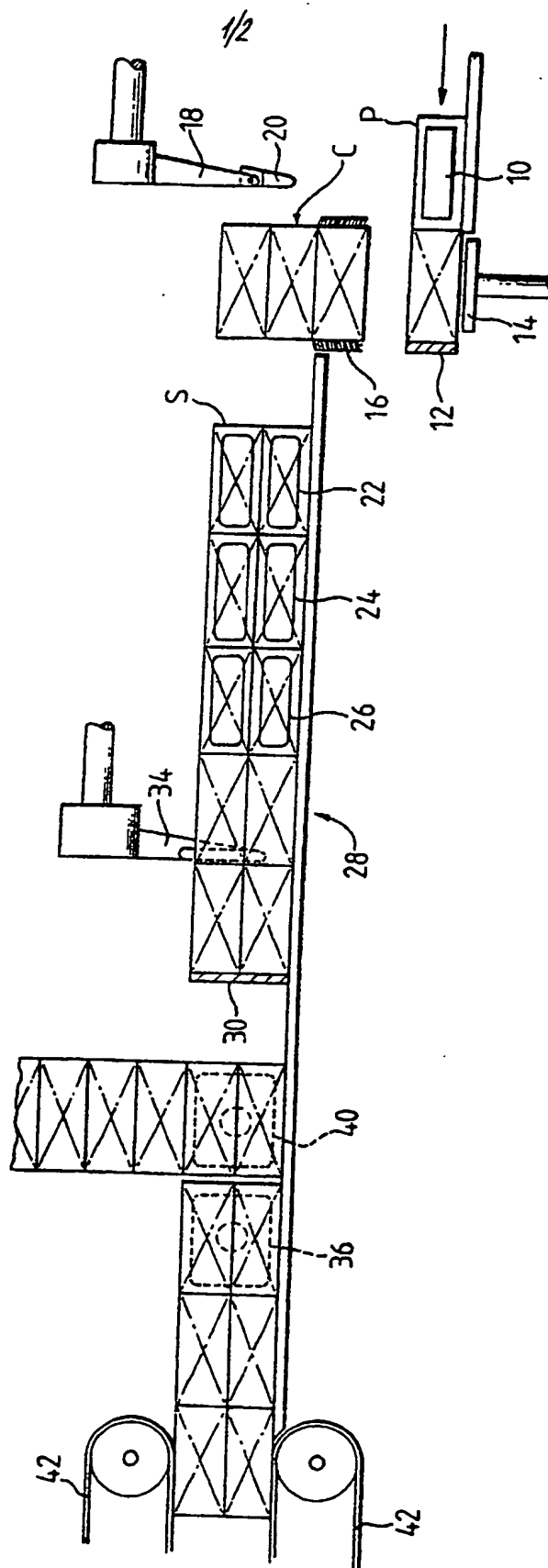


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Fig. 1.



SPECIFICATION

Wrapping machines

- 5 This invention relates generally to wrapping machines and particularly, though not exclusively, to machines for wrapping articles of the tobacco industry such as cigarette packets. More especially the invention is concerned with conveying a succession of such
- 10 articles emerging from a wrapping machine in which some articles may be defective and need to be rejected and/or to which some satisfactory articles may need to be added prior to groups of articles being packaged in boxes.
- 15 In a known arrangement for rejecting wrapped articles, e.g. cigarette packets, a void is created as a result of each rejection and this has to be filled by a make-up stack of satisfactory so-called "refeed" packets. If a large number of articles have to be
- 20 rejected this arrangement can result in a shortage of refeed packets, which condition may have to be corrected by taking satisfactory packets already packaged in boxes and removing them from the boxes to use as refeed packets.
- 25 It is an object of this invention to provide an arrangement in which such a refeed of articles may be operated independently of any rejection of articles.
- According to one aspect of the invention there is provided a method of conveying successive articles
- 30 from the end of a line of abutting articles which are advanced intermittently one article at a time, comprising transferring each foremost article from the end of the line along a path to form a spacing from the next succeeding article to be transferred which is greater
- 35 than the dimension of an article as considered in the direction of said path, and selectively refeeding an article laterally into said spacing in timed relationship with the formation of such spacing, so that at the transfer of the next article from the line two articles
- 40 will be transferred.
- According to another aspect of the invention there is provided apparatus for conveying successive articles from the end of a line of abutting articles which are advanced intermittently one article at a time, comprising
- 45 transfer means for transferring each foremost article from the line along a path to form a spacing from the next succeeding article to be transferred which is greater than the dimension of an article as considered in the direction of said path, and refeed
- 50 means adjacent to said path and selectively operable in timed relationship with said transfer means to refeed an article laterally into said spacing, so that at the transfer of the next article from the line two articles will be transferred by the transfer means.
- 55 The apparatus preferably further comprises reject means immediately downstream of said refeed means for rejecting articles laterally of said path, independently of the operation of said refeed means.
- Downstream of the reject means there may be a
- 60 conveyor for conveying the articles continuously away from said path in a direction in alignment with said path.
- The transfer means may comprise an intermittent pusher, operating along said path. Preferably said path
- 65 is linear and parallel to said line of abutting articles. In

this case the apparatus may further comprise a second pusher to transfer each foremost article from the end of the line transversely across to the start of said path.

- According to a further aspect of the invention there is provided a machine for wrapping articles such as cigarette packets in an outer wrapping (e.g. transparent film) comprising wrapping means for forming an outer wrapping around each successive article to form an intermittent single row of articles at the sides of which are folded closures, collating means for
- 70 converting the articles into regular stacks of a least two superposed articles moving along a line intermittently so that adjacent stacks are in abutting relationship, sealing means for sealing the folded closures of the
- 75 packets in each successive stack to complete the wrapping operation on the packets, transfer means for transferring each foremost stack from the line along a path to form a spacing from the next succeeding stack
- 80 to be transferred which is greater than the dimension of a stack as considered in the direction of said path, and means for selectively refeeding a new stack laterally into said spacing in timed relationship with the operation of said transfer means.
- 85

- Preferably the folded closures are partially sealed upstream of the collating means in order to prevent said closures from opening before reaching the sealing means.

- An example of apparatus in accordance with the invention will now be described with reference to the accompanying drawings, in which:-

- Figure 1 is a side view of the apparatus, and Figure 2 is a plan view corresponding to Figure 1.
- 90 Wrapped cigarette packets P are shown horizontally entering the apparatus to the right of the drawings from a wrapping machine (not shown) which encloses each cigarette packet in a transparent film wrapper to form a folded closure at each opposite end face. Each packet P is received intermittently between a pair of
- 95 tack heaters 10 which partially seal the outer of the pair of flaps of each closure against the underlying inner flap. At the next position, to the left of the tack heaters 10, each successive packet abuts a vertical stop 12 to the left of a vertically reciprocating elevator 14 (see Figure 1). The elevator raises each packet into
- 100 a short column C, which in the position shown contains three packets. The packet at the bottom of the column is held on all four sides by a tufted material formed on the inner wall of a rectangular passage 16 defining the column, so that each packet is prevented
- 105 from sliding back after it has been raised by the elevator 14.

- To the right of the column C is a horizontally reciprocating pusher 18, whose lower half has a pivotable portion 20 so that on its return stroke it can tip backwards and trail over the next packet pushed into the column. When two packets are positioned above the gripping passage 16 the pusher 18 is actuated to transfer the two packets as a stack S to the left. In this position the stack of packets comes
- 120 between a first pair of heaters 22 at each side of the stack. Two similar sets of heaters are positioned to the left of the heaters 22 at positions 24 and 26 respectively, so that each packet in a stack is acted upon in three stages by heaters 22, 24 and 26.
- 125 The stack S to the left of the heaters 26 form a

buffer 28, which may be increased to two stacks if the width of the packets as considered in the direction of movement is smaller than shown; alternatively, if the width of the packets is greater than shown the buffer
 5 may be omitted, in both cases with suitable modifications of the corresponding dimensioned parts of the apparatus.

At the next movement of the pusher 18 the stack S is moved to the left of the buffer 28 against a back
 10 stop 30. At one side of the stack at this position there is a reciprocating transfer pusher 32 (Figure 2) which is operable to transfer the stack horizontally in a lateral direction by a distance slightly greater than the length of a packet or stack. The stack is next acted upon by a
 15 further reciprocating pusher 34 which transfers the stack to the left through a distance greater than twice the width of the packet or stack, as indicated by the arrow 35 (Figure 2).

At the position of delivery of the stack by pusher 34
 20 is a reject station where a transverse pusher 36 can be selectively operated to reject a stack from the new line. The reject pusher 36 is controlled by a memory device, which is connected to various detectors (not shown) on the wrapping machine. For example a rejection
 25 occurs if a stamp has not been applied or has been applied incorrectly to a packet in a stack; or if a packet has been enclosed in a wrapper which is at or near a splice formed between the end of one wrapper web and the start of a new web.

Between the reject pusher 36 and the pusher 34 is a side wall 38 which is open adjacent to a make-up stack of refeed packets R. Positioned behind the bottom two packets of the refeed stack R is a pusher
 30 430 which is selectively operable after the pusher 34 has retracted to refeed a pair of packets. The refeed packets may replace a stack of packets rejected by pusher 36. However the refeed pusher 40 may operate independently of the reject pusher 36. In this case after
 35 the refeed pusher 40 has operated there will be two packets in the path of the pusher 34. Thus at the next operation of the pusher 34 two stacks will be moved to the left.

Further to the left of the reject pusher 36 each stack enters between a pair of continuously moving bands 42
 45 which convey the packets to a collator (not shown), from which groups of five adjacent stacks (i.e. ten cigarette packets) are formed into a box or a parcel, and which does not form part of the present invention.

From the foregoing it will be apparent that the reject
 50 pusher 36 operates independently of the refeed pusher 40 and vice versa; or they may also operate together, thus making a total of three different modes of operation. Such flexibility allows the reject pusher to operate as needed with or without a refeed of packets.
 55 For example at the end of a working shift of packaging, it may be desirable to use up a quantity of satisfactory packets (one of a pair rejected being usually satisfactory). In this case the wrapping machine may be stopped and packets refeed from the
 60 stack R, which will be kept filled by hand.

CLAIMS

A method of sealing the end closures of wrapped
 65 packets, comprising grouping the packets into

collations consisting of adjacent stacks of 2 or more packets and sealing the end closures of successive stacks, wherein the grouping of packets is preceded by the step of at least partially sealing the end closures of each packet to prevent the closures from opening during grouping.

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